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Theoretical-experimental method for determining the parameters of damping based on the study of damped flexural vibrations of test specimens. 1. Experimental basis

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Abstract

A theoretical-experimental method is proposed for determining the logarithmic decrement of materials. The method is based on the measurement of amplitudes of damped vibrations at the free end of cantilever test specimens in the first resonance mode. To determine the damping properties of materials in tension-compression, three-layer test specimens with a steel core and external layers of a soft damping material is used, whereas for the case of shear deformation, steel external layers and a core from a soft damping material layer are employed. A considerable effect of aerodynamic forces on the logarithmic decrement of the vibrations was revealed. This effect can become decisive for test specimens of width exceeding 15 mm. © 2014 Springer Science+Business Media New York.

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Keywords

Aerodynamic damping, Damped flexural vibrations, Experimental setup, Internal damping, Test specimens, Theoretical-experimental method